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EXAMINER	
MCLEAN, K	
ART UNIT	**PAPER NUMBER**
2751	5

DATE MAILED: 11/04/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 08/935,844	Applicant(s) Wilson et al.
	Examiner Kimberly McLean	Group Art Unit 2751

☒ Responsive to communication(s) filed on *Sep 3, 1999* .

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *1-61* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-61* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

DETAILED ACTION

1. The enclosed detailed action is in response to the Amendment submitted on September 3, 1999.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 10-11, 18-19, 39, 40-41, 46-49, 51-52 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohran (USPN: 5,835,953) in view of Ofek (USPN: 5,933,653).

Regarding claims 1, 10, 39, 46-47, 51-52 and 61, Ohran teaches a computer system comprising: a central processing unit (Figure 1, Reference 12, C 8, L 3-25, C 8, L 66-67, C 9, L 1-13); a first storage system that is coupled to the CPU to store information written from the CPU (Figure 1, Reference 20); a second storage system (Figure 1, Reference 24); at least one communication link coupling the second storage system to the CPU, the at least one communication link including a network cloud that is shared with at least one other resource so that no portion of the network cloud is dedicated exclusively to transferring information between the CPU and second storage system (Figure 1, Reference 10; C 9, L 64-67; C 10, L 1-20);

a mirroring controller (disk controller) to mirror (copy) at least some of the information stored in the first storage system in the second storage system (backup) by transferring some of the information through the network cloud (Figure 1, Reference 14, C 9, L 14-24). Ohran teaches that the communication link can be of various forms including the Internet and the Intranet. Thus, it is evident that the communication link in Ohran's system includes non-dedicated transfers of information between the CPU and the second storage system. Also from Figure 1, it is clear that additional primary systems may be included in the system. Ohran does not explicitly disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud. However, Ofek does disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud (C 5, L 1-7, L 27-67; C 6; C 7, L 1-32). In Ohran's system a list of the storage locations that have new data written to them is kept and after some point in time the controller mirrors/copies the data from the primary storage to the backup storage. In Ofek's system the controller mirrors/copies the data from the primary storage to the backup storage in response to the CPU writing data to the first storage system. Thus, in Ofek's system the backup system always has an updated copy of the data on the primary storage and if a failure occurs on the first disk processing can be switched to the backup disk faster. Thus

one of ordinary skill in the art would have recognized the benefits of Ofek's teachings and would have been motivated to modify Ohran's system to mirror data to the secondary (backup) storage system in response to the CPU writing data to the primary storage system for the desirable purpose of increased reliability and to improve the performance of the system.

Regarding claims 2-3, 18-19, 40-41 and 48-49, Ohran teaches that the network cloud may be of any type including the Internet, Intranet (LAN), etc. (C 9, L 64-67; C 10, L 1-20).

Regarding claim 11, Ohran teaches that either the primary system of the backup system may initiate a backup/mirroring process (C 14, L 45-51), therefore, it is inherent that the mirroring means is distributed between the primary and backup storage system.

4. Claims 5, 9, 13, 14, 22-37, 45 and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohran (USPN: 5,835,953) and Ofek (USPN: 5,933,653) in view of Sparks (USPN: 5,212,784).

Regarding claims 9, 14, 22, 33 and 53, Ohran teaches a computer system comprising a central processing unit (Figure 1, Reference 12, C 8, L 3-25, C 8, L 66-67, C 9, L 1-13); a first storage system that is coupled to the CPU to store information written from the CPU (Figure 1, Reference 20); a second storage system (Figure 1, Reference 24); at least one communication link coupling the second storage system to the CPU (Figure 1, Reference 10; C 9, L 64-67; C 10,

L 1-20); and a mirroring controller (disk controller) to mirror at least some of the information stored in the first storage system in the second storage system (backup) by transferring the at least some of the information through the network cloud to the second storage system (Figure 1, Reference 14, C 9, L 14-24). Ohran does not explicitly disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud. However, Ofek does disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud (C 5, L 1-7, L 27-67; C 6; C 7, L 1-32). In Ohran's system a list of the storage locations that have new data written to them is kept and after some point in time the controller mirrors/copies the data from the primary storage to the backup storage. In Ofek's system the controller mirrors/copies the data from the primary storage to the backup storage in response to the CPU writing data to the first storage system. Thus, in Ofek's system the backup system always has an updated copy of the data on the primary storage and if a failure occurs on the first disk processing can be switched to the backup disk faster. Thus one of ordinary skill in the art would have recognized the benefits of Ofek's teachings and would have been motivated to modify Ohran's system to mirror data to the secondary (backup) storage system in response to the

CPU writing data to the primary storage system for the desirable purpose of increased reliability and to improve the performance of the system.

Ohran does not explicitly teach a communication link including a wireless connection. Ohran, however, does state that any communication link could be used with the system (C 10, L 1-20). Sparks does suggest using wireless connection in a backup system (C 7, L 28-36). Sparks teaches that such a configuration would allow transmitting backup data offsite immediately thus improving the reliability of the system. It is also well known that wireless connections such as satellites provide a large transmission capacity and improve reliability due to the lack of wires. Thus, it would have been obvious to one of ordinary skill in the art to use a wireless connection in Ohran's system for increased reliability and increased throughput.

Regarding claims 5, 13, 31, 37-38 and 45, Ohran teaches a central processing unit (Figure 1, Reference 12, C 8, L 3-25, C 8, L 66-67, C 9, L 1-13); a first storage system (Figure 1, Reference 20); a first communication link (See Figure 1 input to number 12 and 20); a first storage system coupled to the CPU via the communication link to store information written from the CPU (Figure 1, Reference 12 and 20); a second storage system (Figure 1, Reference 24); a second communication link coupling the second storage system to the CPU (Figure 1, Reference 10; C 9, L 64-67; C 10, L 1-20); and a mirroring controller to mirror at least some of the information stored in the first storage system in the second storage system (backup)(Figure 1, Reference 14, C 9, L 14-24).

Ohran does not explicitly disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud. However, Ofek does disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud (C 5, L 1-7, L 27-67; C 6; C 7, L 1-32). In Ohran's system a list of the storage locations that have new data written to them is kept and after some point in time the controller mirrors/copies the data from the primary storage to the backup storage. In Ofek's system the controller mirrors/copies the data from the primary storage to the backup storage in response to the CPU writing data to the first storage system. Thus, in Ofek's system the backup system always has an updated copy of the data on the primary storage and if a failure occurs on the first disk processing can be switched to the backup disk faster. Thus one of ordinary skill in the art would have recognized the benefits of Ofek's teachings and would have been motivated to modify Ohran's system to mirror data to the secondary (backup) storage system in response to the CPU writing data to the primary storage system for the desirable purpose of increased reliability and to improve the performance of the system.

Ohran does not teach a third storage system having a third communication link wherein information from the primary storage unit is mirrored thereto. However, Sparks suggest using a

third storage system and a third communication link for coupling the storage device to the CPU as an additional backup systems, wherein some of the information stored in the CPU would be mirrored/copied thereto (C 7, L 12-36). Sparks teaches that the additional backup system would provide simultaneous backup copies, thus increasing the reliability of the system (C 7, L 17-20). This concept is also known in RAID technology. Therefore, it would have been obvious to one of ordinary skill in the art to add a third storage device for storing mirrored information of the first storage device top Ohran's system for increased reliability.

Regarding claims 27-30 and 54-55, it is well known to use satellites and microwave systems for a wireless communication link. It would have been obvious to use either for the desirable purpose of design choice.

Claims 23-26 are rejected for the same reasons as 2, 10, 11 and 12 correspondingly.

Claims 32, 34 and 36 are rejected for the same reasons as 11, 17 and 10 correspondingly.

Regarding claims 35 and 38, multicasting is known in the art. It is an efficient way of transferring data to multiple devices. Thus it would have been obvious to one of ordinary skill in the art to use multicasting in the teachings of Ohran, Ofek and Sparks for the desirable purpose of efficiency.

5. Claims 6-8, 12, 15-16, 20-21, 42-44, 50 and 56-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohran (USPN: 5,835,953) and Ofek (USPN: 5,933,653) in view Staheli et al. (USPN: 5,537,533).

Regarding claims 12 and 56-57, Ohran teaches a computer system comprising a central processing unit (Figure 1, Reference 12, C 8, L 3-25, C 8, L 66-67, C 9, L 1-13); a first storage system that is coupled to the CPU to store information written from the CPU (Figure 1, Reference 20); a second storage system (Figure 1, Reference 24); at least one communication link coupling the second storage system to the CPU (Figure 1, Reference 10; C 9, L 64-67; C 10, L 1-20); and a mirroring controller to mirror at least some of the information stored in the first storage system in the second storage system (backup) by transferring the at least some of the information over the communication link (Figure 1, Reference 14, C 9, L 14-24).

Ohran does not explicitly disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud. However, Ofek does disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud (C 5, L 1-7, L 27-67; C 6; C 7, L 1-32). In Ohran's system a list of the storage locations that have new data written to them is kept and after some point in time the controller

mirrors/copies the data from the primary storage to the backup storage. In Ofek's system the controller mirrors/copies the data from the primary storage to the backup storage in response to the CPU writing data to the first storage system. Thus, in Ofek's system the backup system always has an updated copy of the data on the primary storage and if a failure occurs on the first disk processing can be switched to the backup disk faster. Thus one of ordinary skill in the art would have recognized the benefits of Ofek's teachings and would have been motivated to modify Ohran's system to mirror data to the secondary (backup) storage system in response to the CPU writing data to the primary storage system for the desirable purpose of increased reliability and to improve the performance of the system.

Ohran does not explicitly teach a communication link being selected from a group consisting of an Ethernet link, an asynchronous transfer mode (ATM) link, and FDDI link and a fibre channel link. Ohran, however, does state that any communication link could be used with the system (C 10, L 1-20). Staheli does disclose at least one communication link coupling the second storage system to the CPU, where the at least one communication link is one of an Ethernet link, an asynchronous transfer mode (ATM) link, FDDI link or a fibre channel link (C 12, L 49-63). There are advantages and disadvantages to using the different communication links stated above and depending on a system's applications, users, cost and other factors one of ordinary skill in the art would have been motivated to use one of an Ethernet link, an asynchronous transfer mode (ATM) link, FDDI link or a fibre channel link for the desirable purpose of design choice.

Regarding claims 6-8, 15-16, 20-21, 42-44, and 50 Staheli discloses using a plurality of communication paths for parallel transfer of packets (C 10, L 52-62). It also known in the art to transfer data on parallel paths for increased throughput (such as Packet switch networks). Thus, it would have been obvious to one of ordinary skill in the art to add a plurality of communication paths for parallel transferring of data packets to Ohran's system for increased throughput and improved system performance.

Claim 58 is rejected for the same reason as 11 above.

6. Claims 4, 17 and 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohran (USPN: 5,835,953) in view of Ofek (USPN: 5,933,653) and Black (Computer Networks: Protocols, Standards and Interfaces, 2nd Edition, 1993).

Ohran disclose a computer system comprising a central processing unit (Figure 1, Reference 12, C 8, L 3-25, C 8, L 66-67, C 9, L 1-13); a first storage system that is coupled to the CPU so that the CPU can store information in the first storage system (Figure 1, Reference 20); a second storage system (Figure 1, Reference 24); at least one communication link coupling the second storage system to the CPU (Figure 1, Reference 10; C 9, L 64-67; C 10, L 1-20); and a mirroring controller to mirror at least some of the information stored in the first storage system in the second storage system (backup) by transferring the at least some of the information over the communication link (Figure 1, Reference 14, C 9, L 14-24).

Ohran does not explicitly disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud. However, Ofek does disclose a mirror controller responsive to the information being written from the CPU to the first storage system to mirror at least some of the information written from the CPU to the first storage system in the second storage system by transferring the at least some of the information through the network cloud (C 5, L 1-7, L 27-67; C 6; C 7, L 1-32). In Ohran's system a list of the storage locations that have new data written to them is kept and after some point in time the controller mirrors/copies the data from the primary storage to the backup storage. In Ofek's system the controller mirrors/copies the data from the primary storage to the backup storage in response to the CPU writing data to the first storage system. Thus, in Ofek's system the backup system always has an updated copy of the data on the primary storage and if a failure occurs on the first disk processing can be switched to the backup disk faster. Thus one of ordinary skill in the art would have recognized the benefits of Ofek's teachings and would have been motivated to modify Ohran's system to mirror data to the secondary (backup) storage system in response to the CPU writing data to the primary storage system for the desirable purpose of increased reliability and to improve the performance of the system.

Ohran does not explicitly teach a communication link being one of a packet switch network and a cell switch. Ohran, however, does state that any communication link could be used

with the system (C 10, L 1-20). It is evident that issues such as applications, cost and other factors would dictate the use of one type of communication link versus another. It is really an issue of design choice. Black teaches in Computer Networks: Protocols, Standards and Interfaces, pages 159 -161, that organizations with low to medium traffic volumes could benefit from a packet switch network because most of the carriers charge on the volume of traffic. Thus it would have been obvious to one of ordinary skill in the art to use a packet switch network in Ohran's system for a system with low to medium traffic volumes for the desirable purpose of efficiency and cost.

Response to Arguments

7. Applicant's arguments filed have been fully considered but they are not persuasive. Applicant states that Sparks describes backing up data and not data mirroring. It is well known in the art that mirroring is a form of backing up data. Backing up data is merely writing a duplicate of the data stored in a primary storage device to a secondary storage device. The backup device is a copy (mirror) of the primary device.

8. Applicant's arguments with respect to claim 1-61 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly McLean whose telephone number is (703) 308-9592 (e-mail address: Kimberly.McLean@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan, can be reached on (703) 305-9712.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-9000.

Any formal response to this action intended for entry should be mailed to Commissioner of Patents and Trademarks, Washington, D.C. 20231 or faxed to (703) 305-9051 and labeled "FORMAL" or "OFFICIAL". Any informal or draft communication should be faxed to (703) 308-6606 and labeled "INFORMAL" or "UNOFFICIAL" or "DRAFT" or "PROPOSED" and followed by a phone call to the Examiner at the above number. Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

KNM

October 27, 1999

EDDIE P. CHAN
SUPERVISORY PATENT EXAMINER